

The Fast Tracker Upgrade to the ATLAS Detector

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When the LHC reaches beyond its current design luminosity, the load on the Level-2 trigger system will increase significantly due to both the need for more sophisticated algorithms to suppress backgrounds and the larger event sizes. The Fast Tracker (FTK) is a custom electronics system that will operate at the full Level-1 accepted rate of 100 KHz and provide high quality tracks at the beginning of processing in the Level-2 trigger, by performing track reconstruction in hardware with massive parallelism of associative memories (AM) and FPGAs.

The latest performance results in important physics for high luminosity LHC running areas will be presented using data from the ATLAS Monte Carlo simulation at different LHC luminosities. An overview of the system design and the status of R&D of individual components will be presented. Related technologies, such as AM chip and Advanced Telecommunications Computing Architecture (ATCA), will be discussed.

APS member ID

61142811

Primary author: AUERBACH, Benjamin (Argonne National Laboratory)

Presenter: AUERBACH, Benjamin (Argonne National Laboratory)

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